STUDIES IN THE SENECIONEAE (ASTERACEAE). IV.

THE GENERA MESADENIA, SYNEILESIS, MIRICACALIA, KOYAMACALIA AND SINACALIA

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Among the true members of the tribe Senecioneae the second most consistently recognized genus name is Cacalia L. Authors that place such elements as Ligularia Cass. and Kleinia L. in synonymy seem able to accept Cacalia as distinct. This is remarkable for many reasons of which the most important are the unnatural limits of the concept, the unreliability of both of the most commonly used genus characters, and the fact that the proper type of the genus is an Adenostyles rather than anything generally recognized as a Cacalia. The genus Cacalia has been usually interpreted as those members of the Senecioneae with white flowers and lacking rays. Attempts have been made to recognize C. atriplicifolia L. as the lectotype. Both of these concepts need extensive correction.

Regarding the typification of Cacalia, the initial clarification was by Rydberg (1924) with further statements by Cuatrecasas (1960) and Pippen (1968). The statement by Cuatrecasas was the most important but was unfortunately obscured by the dropping of a line in printing. The corrected part of the second paragraph is as follows: "In addition to the reasons given by Rydberg (among them the description of the styles by Linné, as long as and similar to those of Eupatorieae), I wish to point out that Linné described Cacalia with tetramerous corollas as early as the second edition of Genera Plantarum, 1742, page 401: 'corollis hermaphroditis quadrifidis.' Similarly, in the 8th edition (Schreber 1791, page 545): 'limbo quadri-f.quinquefido'. Tournefort (1700, Inst. p. 452, fig. 258, cited by Linné) wrote: 'Cacalia differt a Senecione flosculis quadrifariam scissis.' Among all species of Cacalia in Linne's Species Plantarum, Cacalia alpina is the only one with elongate, curled stigmas and 4-merous corollas." True Cacalia is Adenostyles though it would be hopelessly confusing to apply the name in that genus. Conservation of the genus name Adenostyles is to be recommended.

Thought might be given to conservation of the Cacalia in the non Linnean sense, but such a distortion of the original concept could only conserve a minor part of the Cacalia of later authors. The suggested lectotype, Cacalia atriplicifolia L., is a member of the group noted here as Mesadenia Raf. from the southeastern

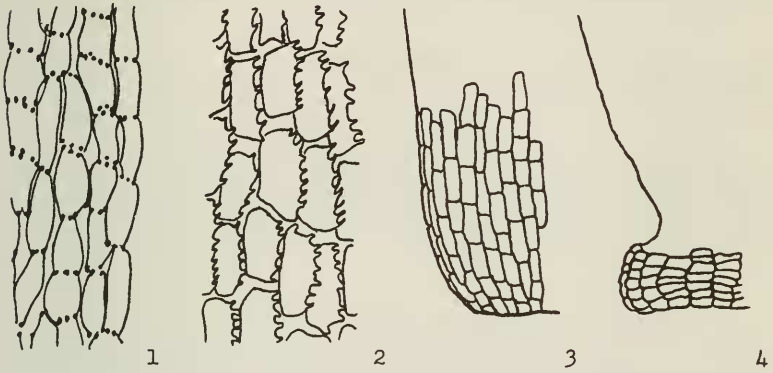
United States. In any case the mexican and asiatic species must be segregated. The mexican species have already been treated by Pippen (1968) and placed in the various genera Digitacalia Pippen, Pericalia Cass. ex Rydb., Odontotrichum Zucc. and Psacalium Cass. Some asiatic species have already been placed in the segregate genera Syneilesis Maxim. and Miricacalia Kitam. The scrupulous avoidance of new names for the group called Cacalia in Asia in the past has necessitated the description of the new genus Koyamacalia here.

The delimitation of Cacalia in the past has served well in some limited areas but on the whole it has been a farce. The flower color is actually yellow in some species that have been placed in the group and white in others that have been excluded. Ray flowers are lacking in many isolated species among the Senecioneae but are present in genera such as Ligularia L. of Asia and Pippenalia McVaugh of Mexico which are closely related to different elements in the broad concept of Cacalia. At best, it is possible to recognize a larger element in the Senecioneae which contains such genera as Psacalium, Mesadenia, Syneilesis, Miricacalia, Koyamacalia, Ligularia and Pippenalia. This larger element has a tendency toward white flowers and lack of rays but such types are often more closely related to species with yellow flowers and rays than to each other. It is possible to recognize many members of the larger "Cacalioid" relationship by the often broadly palmate or even peltate leaves but this character like the flower color and rays is inexact. Bases of anthers have often been used in the Senecioneae but have proven erratic. The style tips of the "Cacalioid" group are blunt in almost all members but the character is neither unique to the group nor totally reliable in the asiatic species. Characters derived from this study, exothecial cells and carpopodial structure, prove excellent at the generic level but useless at defining the overall relationship. The variation in the characters cited is often so patterned as to suggest intergeneric hybridization as a major mechanism in the evolution of the Senecioneae.

It must be acknowledged that no character has yet been found that perfectly sets off the "Cacalioid" Senecioneae. Two characters that show an amazingly close correlation, however, are the anther collars and the stigmatic lines. The enlargement at the bases of the anther collars has been noticed by many authors including Cassini and they have occasionally been illustrated in outline. It was Koyama (1967) who seems to have first noted the tendency for the character to be restricted to certain groups in the Senecioneae. The anther collars of the "Cacalioid" genera never have the enlarged or thinner walled basal cells. Among these I would include a number of groups presently placed in the broad concept of Senecio. Stigmatic lines of the "Cacalioid" genera are, as indicated in previous papers in this series, covering the complete inside surface of the style branches. In most other Senecioneae including typical Senecio the stigmatic surface is divided into two distinct lines. By the combination of these two characters

the limits of a distinct "Cacalioid" group can be seen. The group is mostly northern hemisphere with only Chersodoma Philippi and Paracalia Cuatr. noted thus far from South America. It should be noted that the name "Cacalioid" is erroneous since Adenostyles, the true Cacalia, is not "Cacalioid" in the present sense.

Two characters raised to prominence here at the generic level are the exothecial cells and the cellular structure of the carpopodium. The exothecial cells of Senecio and its closer relatives do not seem very reliable but those of the "Cacalioid" species seem to correlate well with other characters. The exothecial cells of the asiatic members have thickenings on the transverse or end walls (Fig. 1). Most Western Hemisphere species have thickenings along the lateral walls (Fig. 2). The forms of carpopodia in the "Cacalioid" group are not unique to that group, but one of the forms in the group is particularly useful in delimiting one group



Figs. 1-2. Exothecial cells. 1. Koyamacalia nikomontana (Matsum.) Robinson & Brettell. 2. Mesadenia reniformis (Muhl.) Raf. Figs. 3-4. Carpopodial cells. 3. Koyamacalia nikomontana. 4. Mesadenia reniformis.

of genera. The series including Miricacalia and Koyamacalia has elongate cylindrical carpopodia with oblong very thick-walled cells (Fig. 3). The thick walls are heavily lined with pores. Carpopodia of other genera are shorter and sometimes tapering with quadrate and usually thinner-walled cells (Fig. 4). The characters are regarded as of generic significance in the group.

The present paper is intended to summarize some of the necessary divisions among "Cacalioid" genera in three primary areas, Mexico, S.E. United States, and Eastern Asia.

MEXICO

The "Cacalioid" genera of Mexico are a far more extensive

series than suggested by Pippen (1968). Present concepts would recognize at least six genera:

DIGITACALIA Pippen. Caulescent plants with palmately lobed leaves, no rays, corolla divided to tube, exothecial cells thickened on end walls.

NELSONIANTHUS Robinson & Brettell. Caulescent epiphytes with ovate leaves, no rays, corolla partially cleft into narrow lobes, exothecial cells thickened on end walls. (See Robinson & Brettell, Studies in the Senecioneae II).

PSACALIUM Cass. Leaves mostly basal with often broad or peltate blades, no rays, corolla divided to tube, exothecial cells with lateral thickenings, with or without pappus. The concept includes Odontotrichum Zucc. and Sciadoseris Kunze. (See Robinson & Brettell, Studies in the Senecioneae III).

PIPPENALIA McVaugh. Leaves mostly basal with peltate blades, rays present, corolla partially cleft into rather narrow lobes, exothecial cells with lateral thickenings, without pappus.

ROLDANA La Llave & Lex. Caulescent plants with ovate to palmate or peltate blades, stems with or without resin ducts, with or without rays, corolla partially divided into short or rather long lobes, exothecial cells with lateral thickenings. The concept is provisionally broad and includes Pericalia Cass. ex Rydb.

PITTOCAULON Robinson & Brettell. Caulescent plants with seasonally deciduous leaves, stems with two rows of resin ducts, leaf blades palmate, rays present, corolla short lobed, exothecial cells with lateral thickenings. (See Robinson & Brettell, Studies in the Senecioneae I).

SOUTHEASTERN UNITED STATES

The "Cacalioid" species of the area can be divided into two groups: Rugelia Shuttlew. ex Chapm. with mostly basal leaves, large heads and exothecial cells with thickenings at ends; and Mesadenia Raf. with more caulescent plants, narrow heads and many exothecial cells with prominent thickenings along the lateral walls. Synosma suaveolens (Ell.) Raf. which is often associated with this group is not "Cacalioid". The species of Mesadenia recognized by Rydberg (1924) and Small (1933) are as follows:

Mesadenia angustifolia Rydb. in Bull. Torrey Bot. Club 51: 378. 1924.

Mesadenia atriplicifolia (L.) Rafin. New Fl. Amer. 4: 79. 1836.

Mesadenia diversifolia (Torr. & A. Gray) Greene, Pittonia 3: 182. 1897.

Mesadenia elliottii Harper, Torreya, 5: 184. 1905.

Mesadenia floridana (A. Gray) Greene, Pittonia 3: 183. 1897.

Mesadenia lanceolata (Nutt.) Rafin. New Fl. Amer. 4: 79. 1836.

Mesadenia maxima Harper ex Small, Fl. S.E. U.S. 1301. 1903.

Mesadenia reniformis (Muhl.) Rafin. New Fl. Amer. 4: 79. 1836.

Mesadenia sulcata (Fernald.) Small Fl. S.E. U.S. 1301. 1903.

Mesadenia tuberosa (Nutt.) Britton. ex Britton & Br. Fl. N. U.S. 3: 474. 1898.

EASTERN ASIA

The "Cacalioid" genera of the Eastern Hemisphere form a complex group with some outlying forms in the Aleutian Islands and the Western United States. The genera of note here are Ligularia, Syneilesis, Miricacalia, Koyamacalia and Sinacalia. All of these show exothecial cells with thickenings on the ends or transverse walls and most species tend to have inflorescences racemose or with racemose branches. Some of the distinctive features of the genera are as follows:

LIGULARIA Cass. Plants with leaves usually mostly basal, bases of petioles prominently sheathing, rays present, achenes glabrous, carpopodium short and tapered with small quadrate cells. (See Koyama 1968). According to Koyama the genus is mostly asiatic where about 100 species have been reported.

SYNEILESIS Maxim. Plants more caulescent, bases of petioles not sheathing, leaf blades at least slightly peltate, no rays, achenes glabrous, carpopodium short cylindrical with small quadrate cells, embryo with one cotyledon. (See Koyama 1969, 1972). The genus contains the following six species:

Syneilesis aconitifolia (Bunge) Maxim., Prim. Fl. Amur. 165. 1859. Cacalia aconitifolia Bunge, Enum. Pl. Chin. Bor. 37, n. 208. 1831.

Syneilesis australis Ling, Contrib. Inst. Bot. Nat. Acad. Peiping, 5: 5. 1937.

Syneilesis intermedia (Hayata) Kitamura, Acta Phytotax. & Geobot. 6: 244. 1937. Senecio intermedius Hayata Mater. Fl. Formos.

155. 1911. nom. illeg. Cacalia intermedia Hayata, Ic. Pl. Formos. 8: 66. 1919. Syneilesis hayatae Kitamura, Journ. Jap. Bot. 10: 702. 1934.

Syneilesis palmata (Thunb.) Maxim., Bull. Acad. Petersb. 19: 487. 1874. Arnica palmata Thunb. Fl. Jap. 319. 1784.

Syneilesis subglabrata (Yam. & Sasaki.) Kitamura, Journ. Jap. Bot. 10: 702. 1934. Cacalia intermedia Hayata var. subglabrata Yam. & Sasaki, Journ. Trop. Agr. 3: 243. 1931. Cacalia subglabrata Kitamura, Acta Phytotax. & Geobot. 1: 148. 1932.

Syneilesis tagawae Kitamura, Journ. Jap. Bot. 10: 701. 1934. in syn.; Mem. Coll. Sci., Kyoto Imp. Univ. Ser. B. 16(3): 171. 1942. Syneilesis aconitifolia var. tagawae Kitamura Comp. Nov. Jap. 1: 24. 1931.

MIRICACALIA Kitamura. Plants more caulescent, bases of petioles slightly sheathing, leaf blades not peltate, involucre with prominent broad calyculus at base, no rays, achenes glabrous and prominently beaked at maturity, carpopodium long cylindrical with oblong thick-walled cells. (See Koyama, 1969). The genus contains one species:

Miricacalia makineana (Yatabe) Kitamura, Acta Phytotax. & Geobot. Kyoto. 5: 214. 1936. Senecio makineanus Yatabe, Bot. Mag. Tokyo. 6: 115. 1892.

KOYAMACALIA H.Robinson & R.D.Brettell, genus novum Asteracearum (Senecioneae). Plantae herbaceae caulescentes. Folia alternata, petiolis base parum vel distincte vaginatis, laminis plerumque triangularibus vel reniformibus non peltatis. Inflorescentiae vel rami plerumque racemose raro corymbosi. Calyculi nulli. Flores radii nulli. Flores disci abli vel flavi; corollae anguste infundibulares, faucis elongatis, lobis 3-4 longioribus quam latioribus; filamenta in parte superiore non inflata; cellulae exotheciales breviter oblongae vel ellipticae, parietibus transversalibus noduliferis; lineae stigmaticae connatae; achaenia glabra non rostrata; carpopodia longe cylindrica, cellulis oblongis, parietibus valde incrassatis prominente microstriatis. Species typica: Cacalia hastata L.

Plants more caulescent, bases of petioles slightly to prominently sheathing, leaf blades not peltate, no distinct calyculus, no rays, achenes glabrous and not beaked, carpopodium long cylindrical with oblong thick-walled cells.

The genus is the element called Cacalia in asian floras. Koyama (1969) reviews the basis for considering Cacalia hastata L. as the lectotype of Cacalia, a concept that would preserve present usage in asian floras but which has no basis in the Code of Nomenclature. Cacalia hastata does not conform with either the protologue

or genus descriptions given by Linneaus. Furthermore, the selection of Cacalia atriplicifolia L. as lectotype would have priority. The history of the usage of the name Cacalia on a world wide basis does not suggest particularly the asian or for that matter any other definable concept as typical. At this point of critical circumscription of the group the only valid action is establishment of a new genus. There is no way that Cacalia hastata can be the type of Cacalia except through an unlikely and unwise act of conservation intended to preserve a part of a misconception.

The genus Koyamacalia is closest on one side to Miricacalia which has the same type of carpopodium but has a distinct calyculus and a beaked achene. Also related to Koyamacalia are the Chinese specimens placed in the following genus Sinacalia distinguished by the presence of ray flowers. Excluded from the concept of Koyamacalia is Cacalia section Vaginales as delimited by Koyama (1969). The latter group shows the habit of Ligularia and the species may prove to belong to that genus in spite of the lack of ray flowers.

The genus is named for Dr. Hiroshige Koyama now curator of phanerogams at the National Science Museum in Tokyo. Dr. Koyama has produced the most critical studies of this group of plants and has provided some useful comments on some of the species during his recent visit.

The genus Koyamacalia contains the following 47 species many of which are included here on the basis of description.

Koyamacalia adenostyloides (Fr. & Sav.) H.Robinson & R.D.Brettell, comb. nov. Senecio adenostyloides Fr. & Sav. ex Maxim., Mel. Biol. 9: 297. 1874.

Koyamacalia amagiensis (Kitamura) H.Robinson & R.D.Brettell, comb. nov. Cacalia amagiensis Kitamura, Comp. Nov. Jap. 1: 23. 1931.

Koyamacalia ambigua (Ling) H.Robinson & R.D.Brettell, comb. nov. Cacalia ambigua Ling, Contr. Inst. Bot. Nat. Acad. Peiping 2: 528. 1934.

Koyamacalia auriculata (DC.) H.Robinson & R.D.Brettell, comb. nov. Cacalia auriculata DC., Prod. 6: 329. 1837.

Koyamacalia bulbiferoides (Hand.-Mzt.) H.Robinson & R.D.Brettell, comb. nov. Cacalia bulbiferoides Hand.-Mzt., Symb. Sin. 7:1131. 1936.

Koyamacalia chenopodifolia (DC.) H.Robinson & R.D.Brettell, comb. nov. Senecio chenopodifolius DC., Prod. 6: 364. 1837.

Koyamacalia cyclota (Bur. & Franch) H.Robinson & R.D.Brettell, comb. nov. Senecio cyclotus Bur. & Franch., Journ. de Bot. 5: 74. 1891.

Koyamacalia dasythyrsa (Hand.-Mzt.) H.Robinson & R.D.Brettell, comb. nov. Cacalia dasythyrsa Hand.-Mzt., Acta Hort. Gotoburg. 12: 296. 1938.

Koyamacalia delphiniifolia (Sieb. & Zucc.) H.Robinson & R.D.Brettell, comb. nov. Cacalia delphiniifolia Sieb. & Zucc., Abh. Acad. Muench. 4(3): 190. 1846.

Koyamacalia deltophylla (Maxim.) H.Robinson & R.D.Brettell, comb. nov. Senecio deltophyllus Maxim., Bull. Acad. Petersb. 27: 487. 1881.

Koyamacalia farfaraefolia (Sieb.& Zucc.) H.Robinson & R.D.Brettell, comb. nov. Cacalia farfaraefolia Sieb. & Zucc., Abh. Acad. Muench. 4(3): 190. 1846.

Koyamacalia firma (Komarov) H.Robinson & R.D.Brettell, comb. nov. Cacalia firma Komarov, Acta Hort. Petrop. 18: 420. 1900.

Koyamacalia hastata (L.) H.Robinson & R.D.Brettell, comb. nov. Cacalia hastata L., Sp. Pl. 2: 835. 1753.

Koyamacalia hupehensis (Hand.-Mzt.) H.Robinson & Brettell, comb. nov. Cacalia hupehensis Hand.-Mzt., Symb. Sin. 7: 1131. 1936.

Koyamacalia hwangshanica (Ling) H.Robinson & R.D.Brettell, comb. nov. Cacalia hwangshanica Ling, Contr. Inst. Bot. Nat. Acad. Peiping. 5: 11. 1937.

Koyamacalia kiusiana (Makino) H.Robinson & R.D.Brettell, comb. nov. Cacalia kiusiana Makino, Bot Mag. Tokyo. 24: 228. 1910.

Koyamacalia latipes (Franch.) H.Robinson & R.D.Brettell, comb. nov. Senecio latipes Franch. in Morot, Journ. de Bot. 8: 356. 1894.

Koyamacalia leucanthema (Dunn) H.Robinson & R.D.Brettell, comb. nov. Senecio leucanthemus Dunn, Joun. Linn. Soc., Bot. 35: 506. 1903.

Koyamacalia levingii (Clarke) H.Robinson & R.D.Brettell, comb. nov. Senecio levingii Clarke, Comp. Ind. 301. 1876.

Koyamacalia macrocephala (Hand.-Mzt.) H.Robinson & R.D.Brettell, comb. nov. Cacalia macrocephala Hand.-Mzt., Notizbl. Bot Gart. Berlin 13: 633. 1937.

Koyamacalia maekawae (Nakai) H.Robinson & R.D.Brettell, comb. nov. Miricacalia maekawae Nakai, Journ. Jap. Bot. 14: 642. 1938.

Koyamacalia matsudae (Kitamura) H.Robinson & R.D.Brettell, comb. nov. Cacalia matsudae Kitamura, Journ. Jap Bot. 20: 196. 1944.

Koyamacalia maximowicziana (Nakai & Maekawa ex Hara) H.Robinson & R.D.Brettell, comb. nov. Cacalia maximowicziana Nakai & Maekawa ex Hara, Journ. Jap. Bot. 10: 432. 1934.

Koyamacalia nikomontana (Matsu,.) H.Robinson & R.D.Brettell, comb. nov. Cacalia nikomontana Matsum., Bot. Mag. Tokyo. 13: 84. 1899.

Koyamacalia nipponica (Miq.) H.Robinson & R.D.Brettell, comb. nov. Cacalia nipponica Miq., Ann. Mus. Bot. Lugd.-Bat. 2: 181. 1866.

Koyamacalia nokoensis (Masam. & Suzuki) H.Robinson & R.D.Brettell, comb. nov. Cacalia nokoensis Masam. & Suzuki, Journ. Soc. Trop. Agr. Taiwan 2: 51. 1930.

Koyamacalia otopteryx (Hand.-Mzt.) H.Robinson & R.D.Brettell, comb. nov. Cacalia otopteryx Hand.-Mzt., Symb. Sin. 7: 1132. 1936.

Koyamacalia palmatisecta (Jeffr.) H.Robinson & R.D.Brettell, comb. nov. Senecio palmatisectus Jeffr., Not. Bot. Gard. Edinb. 9: 128. 1916.

Koyamacalia pelleifolia (J.R.Drumm.) H.Robinson & R.D.Brettell, comb. nov. Senecio pelleifolius King ex J.R.Drumm., Kew Bull. 1911: 271. 1911.

Koyamacalia peltifolia (Makino) H.Robinson & R.D.Brettell, comb. nov. Cacalia peltifolia Makino, Journ Jap. Bot. 5: 27. 1928.

Koyamacalia penninervis (Koyama) H.Robinson & R.D.Brettell, comb. nov. Cacalia penninervis H.Koyama, Mem. Fac. Sci. Kyoto Univ. 2: 180. 1969.

Koyamacalia phyllolepis (Franch.) H.Robinson & R.D.Brettell, comb. nov. Senecio phyllolepis Franch. in Morot, Journ. de Bot. 8: 360. 1894.

Koyamacalia pilgeriana (Diels) H.Robinson & R.D.Brettell, comb. nov. Senecio pilgerianus Diels, Engl. Bot. Jahrb. 36 (Beibl. 82): 106. 1905.

Koyamacalia profundorum (Dunn) H.Robinson & R.D.Brettell, comb. nov. Senecio profundorum Dunn, Journ.Linn. Soc., Bot. 35: 507. 1903.

Koyamacalia pseudotaimingasa (Nakai) H.Robinson & R.D.Brettell, comb. nov. Cacalia pseudotaimingasa Nakai, Bot. Mag. Tokyo 29; 8. 1915.

Koyamacalia quinqueloba (DC.) H.Robinson & R.D.Brettell, comb. nov. Prenanthes quinqueloba Wall. ex DC., Prod. 7: 195. 1838.

Koyamacalia roborowskii (Maxim.) H.Robinson & R.D.Brettell, comb. nov. Senecio roborowskii Maxim., Bull. Acad. Petersb. 27: 487. 1881.

Koyamacalia rockiana (Hand.-Mzt.) H.Robinson & R.D.Brettell, comb. nov. Cacalia rockiana Hand.-Mzt., Notizbl. Bot. Gart. Berlin ser. 8, 3: 165. 1891.

Koyamacalia rubescens (S.Moore) H.Robinson & R.D.Brettell, comb. nov. Senecio rubescens S.Moore, Journ. Bot. 13: 228. 1875.

Koyamacalia rufipilis (Franch.) H.Robinson & R.D.Brettell, comb. nov. Senecio rufipilis Franch. in Morot, Journ. de Bot. 8: 359. 1894.

Koyamacalia shikokiana (Makino) H.Robinson & R.D.Brettell, comb. nov. Cacalia shikokiana Makino, Bot. Mag. Tokyo 12: 80. 1898.

Koyamacalia sinica (Ling) H.Robinson & R.D.Brettell, comb. nov. Cacalia sinica Ling, Contr. Inst. Bot. Nat. Acad. Peiping 5: 7. 1937.

Koyamacalia souliei (Franch.) H.Robinson & R.D.Brettell, comb. nov. Senecio souliei Franch., Bull. Soc. Philom. Paris, ser. 8, 3: 165. 1891.

Koyamacalia tebakoensis (Makino) H.Robinson & R.D.Brettell, comb. nov. Cacalia delphiniifolia var. tebakoensis Makino, Bot. Mag. Tokyo 24: 230. 1910.

Koyamacalia yakushimensis (Masamune) H.Robinson & R.D.Brettell, comb. nov. Cacalia yakushimensis Masamune, Journ. Soc. Trop. Agr. Taiwan 2: 37. 1930.

Koyamacalia yatabei (Matsumura & Koidz.) H.Robinson & R.D.Brettell, comb. nov. Cacalia yatabei Matsumura & Koidz., Bot. Mag. Tokyo 24: 152. 1910.

Koyamacalia zuccarinii (Maxim.) H.Robinson & R.D.Brettell, comb. nov. Senecio zuccarinii Maxim., Mél. Biol. 9: 298. 1874.

SINACALIA H.Robinson & R.D.Brettell, genus novum Asteracearum (Senecioneae). Plantae herbaceae caulescentes. Folia alternata, petiolis base vix vaginatis, laminis triangularibus profunde lobatis vel subpinnatifidis non peltatis. Inflorescentiae pyramidaliter paniculatae, ramis racemosis. Calyculi nulli. Flores radii et disci pauci; corollae flavi anguste infundibulares, faucis elongatis, lobis anguste triangularibus ca. triplo longioribus quam latioribus; filamenta in parte superiore non

vel parum inflata; cellulae exotheciales breviter oblongae vel ellipticae, parietibus transversalibus noduliferis; lineae stigmaticae plerumque connatae; achaenia glabra non rostrata; carpopodia longe cylindrica, cellulis oblongis, parietibus valde incrassatis prominente microstriatis. Species typica: Senecio henryi Hemsl.

Plants more caulescent, bases of petioles scarcely sheathing, leaf blades subpinnately lobed, inflorescence paniculate with racemose branches, no distinct calyculus, few ray and disk flowers, achenes glabrous and not beaked at maturity, carpopodium long cylindrical with oblong thick-walled cells.

The genus is related to Koyamacalia and Miricacalia by the distinctive form of the carpopodium. Sinacalia is distinct from the related genera by the presence of ray flowers. Some of the most distinctive features of Sinacalia are the slight enlargement under the collars in some of the specimens and the partial separation of the stigmatic lines in others. Both characters suggest closer relationship to Senecio. Sinacalia can be easily distinguished from Senecio by the racemose branches of the inflorescence. The mixture of characters in Sinacalia would seem to be the result of parallelisms or hybridization. The genus is unlikely to represent a true phyletic link between the "Cacalioid" and "Senecioid" groups. The form of the enlargement in some of the anther filaments seems to confirm an impression gained from other anther collars in the Senecioneae. This enlargement is in a region below the regular collar. The "Senecioid" form of collar often seems to consist of two distinct parts, the lower part being derived from the tissue below the true collar.

The genus seems to contain two species but the second species is known only from one misidentified specimen from Szechuan under the name Senecio palmatisecta J.F.Jeff. The known species for the genus is as follows:

Sinacalia henryi (Hemsl.) H.Robinson & R.D.Brettell, comb. nov. Senecio henryi Hemsl. in Forbes & Hemsl., Journ. Linn. Soc.,

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Rydberg, P. A. 1924. Some Senecioid genera I-II. Bull. Torrey Bot. Club 51 (9): 369-378; (10): 409-420.

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